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Mr. Newman story

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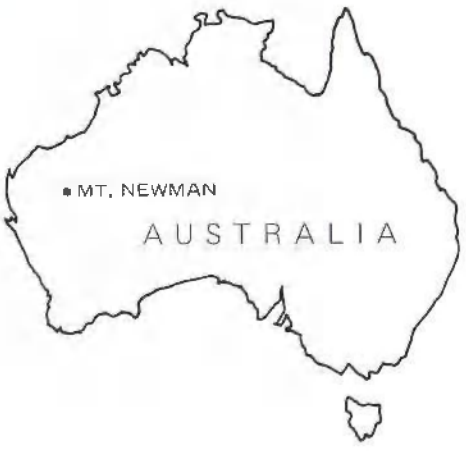
The Mt. Newman Story



by Charles B. Hugall

Although the nickel boom currently holds the national spotlight in the continuing story of Western Australia's outstanding mineral development, approximately six years ago it was the iron ore potential which dominated the scene.

There are many parallels between the Mt. Newman Story and the current nickel boom, but probably the major difference is in the massive type of development required and the much larger capital outlay necessary for an iron ore operation compared with a nickel development.

A further major difference lies in the fact that Mt. Newman had the security of sales contracts lined up even before the ground was broken.

Discovery

As with most other mineral discoveries, one man stands out: the prospector. In the case of Mt. Newman, it was Stan Hilditch, a tall, quiet, weatherbeaten man who had been prospecting in the Pilbara region of Western Australia for years. While searching for manganese on the old Mt. Newman cattle station (ranch), he discovered outcropping iron ore on what is now Mt. Whaleback. He recognized it as highgrade hematite and sent samples off to his partner, mining engineer and inventor Charles Warman. Those samples picked up from Mt. Whaleback in 1957 assayed at 68.8% iron.

Because of the Australian government's embargo on exports of iron, and the then practice of the state of

Western Australia of taking over any claims for iron ore as ministerial reserves, their find remained secret for three years. The embargo was then lifted, and they staked their claim and started to interest potential investors.

Financing

Due to the distance of Mt. Whaleback from the coast, some 250 miles, they knew mining had to be done on a large scale. It was not until 1963 that they were able to interest a group who had not only the resources, but the desire to look closely at their find. This was a group of executives from American Metal Climax Inc. (Amax), diversified American metal miners and fabricators, who had come to Australia because of growing political instability in places where most of their foreign mining effort had until then been concentrated.

Amax policy concerning international projects in which they participate is to seek out a local partner. In this case they chose The Colonial Sugar Refining Co. Ltd., which company was at that time looking to diversify from its traditional sugar base.

As the initial drilling work commenced, the new consortium was busy interesting the Japanese steel industry in the rich potential of Mt. Whaleback. In 1965 they signed a contract with eight Japanese steel companies for the supply of 100 million tons of Mt. Newman ore—at that stage the biggest single raw-materials contract ever negotiated anywhere in the world. Simultaneously the engineering and financial studies commenced. These had not progressed very far before a major obstacle was revealed. The return on capital invested, approximately $200 million, was not enough to attract the loan funds required.

Continuing preliminary work revealed that by increasing the through-put the return on investment became sufficiently attractive to meet the requirements for obtaining substantial loan funds. These requirements were satisfied in mid-1966 by bringing in The Broken Hill Proprietary Company Limited as a partner, a buyer of ore, and an investor, with the special technical and management know-how that this company had developed as Australia's great steel producer.

Finally in April 1967, the Mt. Newman Joint Venturers Agreement was concluded and the project launched publicly with a signing ceremony at which the state of Western Australia gave its seal of approval.

Ore carrier in Port Hedland.
Automatic loading equipment handles
8,000 tons per hour.

Partners

Before the preliminaries were finalized, another two partners joined the consortium. These were Mitsui – C. Itoh Iron Pty. Ltd. and Seltrust Iron Ore Ltd. The joint venturers consist of:

Amax Iron Ore Corporation, a subsidiary of American Metal Climax Inc. (Amax)—25%. Amax is a widely diversified natural resources and minerals development company which mines, smelts, refines, fabricates, and markets metals and minerals.

Pilbara Iron Ltd., a subsidiary of The Colonial Sugar Refining Co. Ltd.—30%. C.S.R. has total assets of over $400 million, and is one of the largest industrial and commercial organizations in Australia. It has widespread interests in sugar, building materials, industrial chemicals, and mining.

Dampier Mining Co. Ltd., a subsidiary of The Broken Hill Proprietary Co. Ltd.—30%. B.H.P. is Australia's largest industrial enterprise, with a work force of 52,000 people, and with 150,000 shareholders, most by far Australian. The company's operations extend to every state. B.H.P. produces about 6.5 million tons of raw steel each year, which is processed into a wide range of rolled steel products. It ranks about 14th among the world's steelmaking companies.

Mitsui – C. Itoh Iron Pty. Ltd. (in which Mitsui & Co. Ltd. has a 70% interest and C. Itoh & Co. Ltd. 30%)—10%. Mitsui is one of Japan's largest and most experienced trading organizations, with a worldwide network of over 100 offices in the world's main cities. Mitsui maintains a continuous flow of import and export of such commodities as iron and steel, nonferrous metals, machinery, chemicals, fertilizers, grains, sugar, foodstuffs, textiles, fuels, and general merchandise. C. Itoh, one of the leading exporters, importers, and general merchants in Japan, has its principal offices in Osaka and Tokyo, with 30 branches and representative offices in major cities in Japan, and 90 overseas offices throughout the world. Besides trading activities, C. Itoh also engages in various industrial undertakings such as manufacturing, construction, and transportation, through investment, financing or other arrangements.

Seltrust Iron Ore Ltd., a subsidiary of Selection Trust Limited—5%. Selection Trust is a British mining-finance house with a valuable portfolio of investments covering a wide range of metals and minerals throughout the world.

Construction

Initial capitalization of approximately $200 million was to provide for:

The Mine—create a township to house, eventually, 5,000 people. This includes a shopping center, hospital, school, police station, swimming pool and sporting facilities, and amenities for a population of this size; provide for open-pit mining operations on Mt. Whaleback, including primary and secondary crusher complex at the foot of the mountain; load-out tunnel over which ore is stockpiled; administration, powerhouse and industrial facilities, together with all mining equipment necessary for the mining operation.

The Port—construct the port and ore pier; provide shipping facilities including provision of tugs for the handling of ore carriers up to 100,000 tons; set up administration, powerhouse, and industrial facilities identical with those at the mine and provide housing for the company staff with all ancillary facilities; construct railway load-out facilities, tertiary crusher, and area for stockpiling. With the exception of the housing, this was all done on spoil reclaimed from the harbor by dredging.

The Railroad—construct a heavy-duty standard-gauge railroad between Newman and Port Hedland, a distance of 265 miles, with all necessary rolling stock and maintenance facilities.

Production

The company set an Australian record in having shipped more than 6.5 million tons in the first year of its operations. It is committed to double this amount in the next year, and even as more equipment and people are provided to meet these increasing annual production targets, a major construction program is in progress to meet its commitment to ship 30 million tons per annum by 1974. It is obviously making a strong bid for leadership of the Australian iron-ore industry in that it already has the largest tonnage in sales contracts of any Australian company—more than 270 million tons.

Cooperation

It has been a remarkable exercise in international cooperation. An Australian team largely runs the Mt. Newman mining operation, and 60% of the money that

Houses for the staff are built of steel that will withstand cyclone winds up to 150 miles per hour. All are air conditioned.

has gone into it has come from Australia. The company would be the first to acknowledge the expertise and technical know-how made available through the other 40% interest in the project which comes from America. Britain, and Japan. It surely demonstrates the advantage to be gained from combining the best in financia and engineering talents on an international scale for the mutual benefit of all concerned.

Operation

Basically, the operation involves the mining of one of the world's richest single deposits of iron ore. A hill, Mt. Whaleback, 3½ miles long, contains an estimated 1 billion tons of high-grade iron ore. In addition, the company has 300 square miles of mineral leases in the Pilbara area, which are now being explored to ascertain what is contained in these potentially promising areas. As stated earlier, open-pit mining methods are used. Benches 50 feet high are developed to obtain the ore, which is initially blasted from the bench face. It is then picked up by electric shovels and placed into rear-dump trucks which take the ore to the crushers, 1½ miles down the 60-foot-wide haulage road which has a steady 7% grade. The ratio of ore to other material which must be removed is slightly less than 1:1.

The ore is crushed in two stages. From the primary crusher to the secondary crusher it is conveyed by 5-foot-wide rubber belting to a sampling station and then to the mine stacker. The stacker places the ore on the stockpile over the load-out tunnel. Trains for the 265-

(Continued on page 25)

mile journey to Port Hedland are loaded by feeding the stockpiled ore through a series of pneumatically actuated chutes set in the roof of the load-out tunnel. Approximately 90 tons of ore are loaded into each car, five cars at a time. The locomotive driver then positions the next five cars under the chutes, and the process continues until the train is fully loaded. The process permits a 135-car train to be loaded with 12,000 tons of ore in about one hour.

The trains make the round trip between the mine and the port in approximately 24 hours. On completion of loading at the mine, the locomotive crew receives train orders via radio from the train dispatcher at Port Hedland, and sets off on the nine-hour journey to the port. Maximum train length has been initially set at 135 loaded ore cars, plus three 3,900 h.p. Mainline Alcoa-Goodwin diesel-electric locomotives. The total train weighs some 16,000 tons, with the payload 12,000 tons.

On arrival at the port, spotters direct the crew to position the first two cars in the car dumper. The locomotives are then uncoupled and shunted into the big loco shop for servicing and maintenance. The crew goes off on rest as another crew prepares to take over. Dumping then commences. Average time for dumping the train and servicing the locomotives is four hours. The new crew then receives its train orders and sets off on the return journey to the mine—perhaps with fuel-oil cars or other supply cars for the mine also attached to the train.

The car dumper stands on chambered foundations 50 feet deep which took 14,000 tons of concrete to construct. Within the chambers are a set of 900-ton surge bins which first take the ore, then feed it through vibratory feeders onto a 100-foot-long conveyor with a belt more than 8 feet wide. This conveyor transfers the ore into a 520-foot-long conveyor riding up through a tunnel from the bottom of the dumper to a transfer station 43 feet above the ground. Here the ore can be switched either straight to the stockpiling conveyors, to an emergency stockpile system, or as is normal, up the conveyors into the 126-foot-high port tertiary crusher building. The crushers in this building reduce the ore to pieces approximately 30 mm in diameter or less. A closed-circuit system ensures that all ore is rescreened and pieces bigger than 30 mm are fed back into the crushers. Ore smaller than 6 mm is screened off and the two sizes of ore are fed through a system of conveyors onto the main 1,750-foot-long stacking conveyors that flank the stockpile areas.

These conveyors feed into the boom stackers which

Ore stock pile over the load-out tunnel

build up the stockpiles of either lumpy ore, 6 mm by 30 mm in size, or fines—under 6 mm. This section of the system is operated by five men, including the two boom-stacker operators. These men sit in an airconditioned cab mounted 40 feet up the 90-foot-high head frame of the stacker. They move it into position on rails straddling the conveyor. They build up the stockpile by lowering or raising the 158-foot-long boom through its reach from ground level to 61 feet as the stackers travel backward and forward along the tracks. The boom can also be slewed across the stockpile. Each of the two stackers can stockpile 4,000 tons of ore an hour.

Reclaiming from the stockpiles is done by two crawler-mounted bucket-wheel reclaimers, each of which has ten buckets on its 26-foot-diameter wheel. They can dig 3,000 tons of ore an hour out of the selected stockpile and feed it back through conveyors in the 46-foot-long wheel boom and the 85-foot-long discharge boom at the rear into hopper cars mounted on rails. The hopper cars are self-propelled bins 30 feet high, with a capacity of 180 tons of ore. As ore spills in from the discharge boom of the bucket-wheel reclaimers, the hopper cars feed the ore to the 2,525-foot-long main conveyor belt running up the center of the stockpile area to the edge of Nelson Point, where the sampling facilities are located. The ore is then transferred onto the conveyor system which will take it out to the pier.

The shiploader which directs the ore into the holds of the waiting ore ships is a mobile 540-ton H-frame structure standing 83 feet high. It supports a telescopic boom 95 feet long from within which the loading conveyor can be shuttled out to a maximum 90 feet from the pier edge.

The big shovel loading a 120-ton dump truck.

The mining operation on top of Mt. Whaleback

Fully extended, the shuttling loading conveyor can also be raised or lowered from 6 feet above the pier deck to 69 feet above the deck. The shiploader can travel to load all the hatches of a 68,000-ton vessel without moving the ship. With this system, ships can be loaded at the rate of approximately 8,000 tons per hour.

A second pier is nearing completion, and a second shiploader will enable two carriers to be loaded simultaneously. Deepening and widening of the harbor channel will allow 150,000-ton vessels to load at Nelson Point by 1975.

Future

As for the future, increased facilities are now being planned for the port, mine, railroad, the townsite at Newman, and the new Port Hedland suburb of Cooke Point. Mt. Whaleback's second mine and crushing plant, stockpiling, and train-loading facilities are to be doubled. New railroad track will be required at Newman and Port Hedland as well as additional passing sidings, at Nelson Point a second car dumper, more screening, crushing plant, ore stackers and reclaimers, and a second shiploader will be constructed. This will enable Mt. Newman to ship 20 million tons a year and provide the basis for shipments of up to 40 million tons a year in the not-too-distant future. This year, Port Hedland will become Western Australia's largest harbor in terms of tonnage shipped.

By world standards, Mt. Newman is a big project. Within the next few years it wil double in size. Perth office of Touche Ross & Co. is proud to be associated with it.